

LOUISIANA DEPARTMENT OF WILDLIFE & FISHERIES



**OFFICE OF FISHERIES
INLAND FISHERIES SECTION**

PART VI -A

WATERBODY MANAGEMENT PLAN SERIES

SPRING BAYOU

LAKE HISTORY & MANAGEMENT ISSUES

CHRONOLOGY

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LAKE HISTORY

GENERAL INFORMATION

Date reservoir formed

Spring Bayou was formed by the Red River and is part of the Red River backwater system (raft lakes). Historically, this area was dependent on backwater from the Red River and annually underwent a cycle of flooding and drying. In 1955, a small 100 foot concrete dam/spillway was constructed on Little River by the Department of Public works. This dam/spillway stabilized water levels and curtailed annual backwater flooding.

Impoundment

Owner –La. Dept. Wildlife & Fisheries

Purposes for creation – Recreational activities (fishing, boating, site seeing, hunting)

Size

2,718 acres

Water shed

30,000 acres, 11:1 watershed ratio – Spring Bayou WMA makes up approximately 12,000 acres of the complex. All water drains through Little River. Major land uses include residential, agricultural and timberland.

Pool stage

41.0' above mean sea level (MSL)

Parish/s located

Located four miles east of Marksville, Louisiana, in Avoyelles parish. Primary access is from La. 1, Mansura and Marksville via La. 107, and 452 and 1190: Latitude: 31.071284 N and Longitude: -92.004016 W.

Border waters

Old River in Mansura, Louisiana

Drawdown description

It takes roughly 21 days for a 3 foot drawdown. To allow for faster dewatering during drawdowns, dredging to connect the deeper, disconnected sections of the waterbody is needed. This area is shown in Appendix 1. At pool stage, the water in this area is approximately 3 feet in depth.

Spillway length – 100 ft.

Gate size – 4 ft. x 4 ft. opening

Number of gates - 3

Condition – Good

Flow rate – gate fully opened can drop the lake 2 inches per day.

Sluiceway location – 200 yards NW of Spillway

Who controls

Avoyelles Parish Police Jury, upon recommendations from the Louisiana Department of Wildlife & Fisheries (LDWF).

LAKE AUTHORITY

General Authority and Purpose

Association

There is no lake association for the Spring Bayou Complex. The LDWF (Inland Fisheries and Wildlife Divisions) manages the Complex either for fisheries or wildlife management area resources. Most of the Complex is composed of the Spring Bayou Wildlife Management Area (SBWMA). Recommendations for water manipulation go from the LDWF to the Avoyelles Parish Police Jury who has control authority over the gates.

Authorization

In 1966, the Louisiana Department of Wildlife & Fisheries made the initial acquisition for the SBWMA by purchasing 11,237 acres. Additional acquisitions in 1969, 1976, 1983 and 1985 have increased the complex slightly over 12,000 acres.

ACCESS

Boat docks

4 public boat ramps all on the Spring Bayou Wildlife Management Area (SEE [APPENDIX I](#) FOR DETAILS)

Piers

None

SHORELINE DEVELOPMENT

State/National Parks

None

Shoreline development by landowners

The areas of Boggy Bayou, Little River and Old River off of the WMA are heavily developed. The majority of the complex resides within the WMA and is not developed.

PHYSICAL DESCRIPTION OF THE WATER BODY

Spring Bayou is a complex of backwater lakes and tributaries, composed mainly of flooded timber which consists of bald cypress (*Taxodium distichum*), black willow (*Salix nigra*), swamp privet (*Forestiera acuminata*), buttonbush (*Cephalanthus occidentalis*), and water elm (*Planera aquatic*). These areas are relatively shallow averaging 3-5 feet deep. In 1989, the main channel was dredged. Depths ranged from 10-12 feet and the channel spanned 4 miles through the complex. In 2009, areas on the north east side of the complex were dredged to improve boater access and water flow. Numerous logs, stumps and submerged vegetation also play a key role in the lake's habitat diversity.

Shoreline length

84 miles (59 miles on WMA and 25 miles private land)

Timber type

Bald Cypress /black willow /buttonbush

Average depth

5 feet in lake proper

Maximum depth

12 feet

Natural seasonal water fluctuation

Water levels can change dramatically from rainfall events or rises in the Red River. Typically, water levels fluctuate an average of 3 feet annually.

EVENTS / PROBLEMS

Aquatic vegetation had taken over much of the Spring Bayou complex. The most abundant submerged vegetation was the nuisance exotic plant, hydrilla (*Hydrilla verticillata*), which covered approximately 75% of the lake by the end of 2006. The waterbody has also accumulated an excessive amount of silt over the years producing a less than suitable spawning substrate for nesting fish. In 1988 and 1989, a channel was dredged 4 miles long connecting the major lake systems on the area. The channel provides deep water of adequate quality to sustain fish during summer/fall drawdowns.

Dewatering of the waterbody is an extended process (about ½ inch/day). Time available for drying substrate is reduced.

In 1994, hydrilla was discovered in Spring Bayou. In two years the plant covered 75% of the water body. Drawdowns were conducted in 1996 and 1997 with little success. Herbicides were used periodically from 1999 – 2012

MANAGEMENT ISSUES

AQUATIC VEGETATION

This backwater lake is relatively clear and subject to submerged vegetation. Predominant species include fanwort (*Cabomba caroliniana*), coontail (*Ceratophyllum demersum*), American lotus (*Nelumbo lutea*) and exotic species such as hydrilla (*Hydrilla verticillata*) and water hyacinth (*Eichhornia crassipes*). Control efforts for water hyacinth include applications of the herbicide 2,4-D (dichlorophenoxy acetic acid). Aquathol (dipotassium salt of Endothall) and Sonar (fluridone) have been used for hydrilla control. Drawdowns have also been used to control vegetative growth. SEE [APPENDIX II](#) CHRONOLOGY OF ACTIVITIES)

Vegetation Type Map Sampling

Aquatic vegetative type mapping has been conducted since 1983. Years in which sampling occurred include: 1983, 1999, 2000, 2003, 2004, 2005, 2006, 2007, 2010, 2011 and 2012. (SEE [APPENDIX III](#)).

Biomass Sampling

Conducted in 2000

Species	Grand Bay	Grand Coulee	Tee Lac	Tete de Bouef
Chara	0	1.62*	0	0
Coontail	22.38*	40.34*	40.90*	66.28*
Hydrilla	773.63*	810.83*	981.67*	365.48*

* Grams per cubic meter

Treatment history by year available

Biological-

In January 2008, a total of 11,215 triploid grass carp were stocked in Spring Bayou to reduce hydrilla infestations. Of these, 50 TGC were implanted with transmitters and telemetry equipment was used to track their movements within the lake. In August 2008, Hurricane Gustav caused heavy flooding which resulted in low dissolved oxygen levels and caused numerous fish kills throughout the Complex. An additional 10,000 TGC were stocked in March of 2011. Ten of these fish were implanted with transmitters and tracked for 18 months. Shortly after stocking, the Mississippi River Flood of 2011 inundated the Complex with three feet of water, again causing low dissolved oxygen levels and more fish kills. (Triploid grass carp report 2011-2012 – see [APPENDIX IV](#)).

A total of 20,000 TGC were stocked into Spring Bayou in the fall of 2013, and another 20,000 in the fall of 2014 in an effort to control submersed aquatic vegetation.

Chemical

In 2008, foliar herbicide applications were conducted for control of nuisance plants such as water hyacinth, duckweed (*Lemna minor*), pennywort (*Hydrocotyle spp.*), American lotus, alligator weed (*Alternanthera philoxeroides*), cut grass (*Zizaniopsis miliacea*), frog's bit (*Limnobium spongia*), parrot feather (*Myriophyllum aquaticum*), sedge (*Cyperus compressus*), and common salvinia (*Salvinia minima*) in areas used by recreational fishermen. A total of 1,170 gallons were applied covering 1,959 acres. The herbicide 2,4-D was applied at a rate of 0.5 gallons per acre to control water hyacinth, pennywort, alligator weed, and American lotus. Diquat (Knockout and Reward) was applied at a rate of 0.75 gallons per acre for duckweed, frog's bit and parrot feather, and glyphosate (Aquamaster and Aqua Star) at a rate of 0.75 gallons per acre to control common salvinia and sedge.

In 2009, foliar herbicide applications were made on nuisance plants such as water hyacinth, duckweed, pennywort, American lotus, alligator weed, cut grass, frog's bit, parrot feather, primrose, sedge, and common salvinia in Spring Bayou. A total of 1,095 gallons were applied covering 1,828 acres. To control water hyacinth, pennywort, alligator weed, primrose and American lotus, 2,4-D was applied at a rate of 0.5 gallons per acre. Diquat was applied at 1.0 and 0.75 gallon per acre rates for duckweed, frog's bit and parrot feather, and glyphosate and imazamox (Clearcast) at 0.75 gallons per acre to control common salvinia and sedge.

In 2009, a total of 614 acres of hydrilla in Spring Bayou were treated using the systemic herbicides Sonar Q (quick release) and Sonar PR (precision release). Areas treated were Tete De Bouef (75 acres), Lac a Deux Boute (97 acres), Coulee Noir (235 acres) and Tee Lac (208 acres). In Tete De Bouef and Lac a Deux Boute only, Sonar PR was applied totaling 1,170 pounds at a rate of 6.8 ppb. The other two areas were treated with Sonar PR and Q, totaling 840 pounds each at a rate of 3.8 ppb. Results were poor in Coulee Noir and Tee Lac, but good in the other two areas treated.

In 2010, foliar herbicide applications were made in Spring Bayou on nuisance plants such as water hyacinth, duckweed, pennywort, American lotus, alligator weed, cut grass, frog's bit, parrot feather, primrose, sedge, and common salvinia. A total of 1,710 gallons were applied covering 2,696 acres. To control water hyacinth, pennywort, alligator weed, primrose and American lotus, 2,4-D was applied at a rate of 0.5 gallons per acre. Diquat was applied at 1.0 and 0.75 gallons per acre for duckweed, frog's bit and parrot feather, and glyphosate at 0.75 gallons per acre to control common salvinia and sedge.

In 2010, an experiment combining the systemic herbicide penoxsulam (Galleon®) with the contact herbicide endothall (Aquathol K®) was utilized to control the spread of hydrilla. Total Galleon® volume used was 45 gallons, while a total of 1,080 gallons of Aquathol K® were dispersed. Galleon® was applied at a rate of 20 ppb and Aquathol K® at a rate of 1 ppb. Areas treated were Old River, Boggy Bayou, Coulee Noir and Lac a Deux Boute. Also, a Sonar application was implemented at Tete de bouef to compare with the experiment. Tete de bouef (75 acres) was treated with 510 pounds of Sonar PR® at a rate of 6.8 ppb. Results from the Galleon/Aquathol treatment were fair, initially reducing hydrilla coverage but plant re-growth was rapid. Results from the Sonar application were good as hydrilla growth was minimal and plants had not returned as of December of 2011.

In 2011, foliar herbicide applications were made in Spring Bayou on nuisance plants such as water hyacinth, duckweed, pennywort, American lotus, alligator weed, cut grass, frog's bit, parrot feather, primrose, mosquito fern (*Azolla caroliniana*), and common salvinia. A total of 1,982 gallons were applied to 2,841 acres. To control water hyacinth, pennywort, alligator weed, primrose and American lotus, 2,4-D was applied at a rate of 0.5 gallons per acre. Diquat was applied at 0.75 gallons per acre for duckweed, frog's bit, and parrot feather. Glyphosate was applied at 0.75 gallons per acre to control common salvinia and mosquito fern.

In May 2011, a total of 115 acres of hydrilla were treated in Spring Bayou using the systemic herbicides Sonar PR & Q. Areas treated were Old River (70 acres) and Boggy Bayou (45 acres). In Old River, the total Sonar PR® & Q treatment applied was 480 pounds at a rate of 3.42 ppb. In Boggy Bayou, the total Sonar PR® & Q treatment applied was 270 pounds at a rate of 3.33 ppb. The herbicide was applied 14 days prior to the 2011 flood event that caused water levels in the lake to rise 3 feet above pool stage. Even with this amount of water flowing through the system, results were good as hydrilla growth was reduced in these areas and continued to remain low throughout the year.

In 2012, foliar herbicide applications were made in Spring Bayou on nuisance plants such as water hyacinth, duckweed, pennywort, American lotus, alligator weed, frog's bit, primrose, and common salvinia. A total of 1,510 gallons were applied to 3,676 acres. To control water hyacinth, pennywort, alligator weed, primrose and American lotus, 2,4-D was applied at a rate of 0.5 gallons per acre. Diquat was applied at 0.75 gallons per acre for duckweed, frog's bit, and parrot feather. Glyphosate was applied at 0.75 gallons per acre to control common salvinia.

In May 2012, a total of 250 acres of hydrilla in Grand Lac were treated using the systemic herbicides Sonar PR & Q. The total Sonar PR & Q applied was 480 pounds at a rate of 3.42 ppb. Monthly site investigations were made and results were good as hydrilla growth was reduced in this area as of August 2012.

In August 2013, a total of 19 acres of hydrilla was treated in Coulee Noir, Tee Lac and Lac a de Boutte to clear access lanes using an in-water treatment of the contact herbicide Aquathol K at a rate of 4 ppm. Upon investigation a month later, these lanes were opening up and allowing boating access. Also, 6 acres of hydrilla were treated at all four boat landings using the systemic herbicides Sonar PR & Q at a rate of 6 ppm. By October 2013, hydrilla infestations were considerably reduced in these areas.

In 2014, foliar herbicide applications were made on nuisance plants such as water hyacinth, American lotus, alligator weed, pennywort, duckweed, frog's bit, and common salvinia in Spring Bayou. A total of 622 gallons were applied to 964 acres. Foliar applications of 2,4-D (0.5 gal/acre) were used to control water hyacinth and American lotus. Glyphosate was applied at 0.75 gallons per acre to control common salvinia and frog's bit. Diquat was applied at 1.0 gallons per acre to control duckweed. Imazapyr (0.5 gal/acre) was used to control primrose and alligator weed. In August of 2014, approximately 300 acres of American lotus were treated by aerial application using a private helicopter contractor. Glyphosate (0.5 gal/acre) was applied in areas such as Tete de Bouef, Grand Coulee, Tee Lac

and Grand Lac. A site investigation was made a month after the application and it proved to be very successful.

Contact and systemic herbicides have both been used to combat the spread of hydrilla in Spring Bayou. Systemic herbicides have reduced hydrilla growth in these treated areas.

In December 2014, hydrilla coverage was approximately 450 acres throughout the complex. Water hyacinth, pennywort, primrose and alligator weed covered approximately 600 acres. Common salvinia and American lotus covered approximately 300 acres, and duckweed and frog's bit covered approximately 150 acres.

Table 1. Herbicide applications employed to control nuisance aquatic vegetation on Spring Bayou, Louisiana, from 1996 – 2014.

Spring Bayou Herbicide Applications				
Year	Gallons	Pounds	Acres	Vegetation
1996	605		1,210	Hyacinth/alligator weed/American lotus/pennywort/primrose
1997	124		428	Hyacinth/alligator weed/American lotus/pennywort/primrose
1998	455	605	872	Hyacinth/alligator weed/pennywort/primrose/American lotus/common salvinia & Hydrilla (Sonar Treatment)
1999	40	840	360	Hydrilla (Sonar treatment) & Aquathol
2000	12.1		202	Hydrilla (Sonar AS treatment)
2001	1108		2,016	hyacinth/duckweed/alligator weed/pennywort/common salvinia
2002	786		1,660	Hydrilla (Sonar AS treatment) & hyacinth/duckweed/alligator weed/pennywort/common salvinia
2003	628		1,056	hyacinth/American lotus/duckweed/common salvinia/alligator weed/frog's bit/pennywort
2004	1623		3,003	hyacinth/American lotus/duckweed/common salvinia/alligator weed/frog's bit/pennywort
2005	395		790	Hyacinth/Alligator weed/American lotus/pennywort/primrose
2006	749		1,392	hyacinth/duckweed/alligator weed/pennywort/common salvinia/frog's bit/paragrass
2007	2,742	3,960	2,784	hyacinth/American lotus/a lligator weed/frog's bit/pennywort/primrose/common salvinia/duckweed & hydrilla
2008	1171		1,960	hyacinth/American lotus/duckweed/common salvinia/alligator weed/frog's bit/pennywort/cut grass
2009	1,096	2,850	2,437	hyacinth/American lotus/duckweed/common salvinia/alligator weed/frog's bit/pennywort/cut grass & hydrilla
2010	2,835	720	3,752	hyacinth/American lotus/duckweed/common salvinia/alligator weed/frog's bit/pennywort/cut grass & hydrilla
2011	1,878	750	2,893	hyacinth/American lotus/duckweed/common

				salvinia/alligator weed/frog's bit/pennywort/cut grass & hydrilla
2012	1,510	480	3,926	hyacinth/American lotus/duckweed/common salvinia/alligator weed/frog's bit/pennywort/cut grass & hydrilla
2013	1,326	140	2,208	hyacinth/American lotus/duckweed/common salvinia/alligator weed/frog's bit/pennywort/ & hydrilla
2014	822	140	1,264	hyacinth/American lotus/duckweed/common salvinia/alligator weed/frog's bit/pennywort/ & hydrilla

HISTORY OF REGULATIONS

Recreational

Louisiana statewide recreational fishing regulations have been in effect for Spring Bayou for all freshwater game fish species since creation of the impoundment. Recreational activities commence year round and, during duck season fishing activities resume at 2 pm. Bag and size limits are consistent with state regulations except for a daily take limit for crawfish on the WMA. Recreational fishing regulations may be viewed at the link below:

<http://www.wlf.louisiana.gov/fishing/regulations>

Commercial

Commercial activities were allowed year round Monday through Friday except for hoop net and slat traps that are allowed any day. Permits are issued to applicants to harvest commercial species. During duck season, fishing activities resume at 2 pm.

Louisiana commercial fishing regulations may be viewed at the link below:

<http://www.wlf.louisiana.gov/fishing/regulations>

DRAWDOWN HISTORY

Spring Bayou has an extended history of aquatic vegetation problems. Related problems include restrictions to boating and angler access. There have been several drawdowns (1982, 1984 and 1986) to control submerged vegetation and to oxidize and compact bottom sediments. In 1994, hydrilla was discovered. In two years, this plant covered 75% of the lake. A fall drawdown in 1996 was unsuccessful due to high water. A summer/fall drawdown in 1997 had some degree of control. At present, hydrilla covers approximately 15 percent throughout the lake. Drawdowns that have been recommended by LDWF after 1997 were not supported by local citizens.

Drawdown dates

There have been 7 drawdowns (Table 2) conducted to control of submerged aquatic vegetation. Drawdowns were conducted in the fall from September – December (Fall/Winter) and in the summer from June - September.

Table 2. Drawdown's conducted on Spring Bayou, Louisiana by year from 1984 – 2007.

YEAR	PURPOSE	FISHING CLOSURE	DEPTH (ft)	% EXPOSED	FISH KILL
1982	Control of native submerged vegetation	No	2	25	No
1984	Control of native submerged vegetation	No	3	35	No
1986	Control of native submerged vegetation/oxidize bottom sediments	No	3	35	Yes
1996	Hydrilla control	No	3	35	No
1997	Hydrilla control	No	3	35	Yes
*1999/2000	Hydrilla control	No	2	35	No

* Natural drawdown due to dry conditions (drought) – lowered the lake approximately 1.5- 2 ft.

As shown in Table 2, drawdowns have been an important tool in managing aquatic vegetation in Spring Bayou. From 1982 – 1986, native vegetation such as coontail and fanwort was the primary concern. The drawdowns occurring in 1996 and later targeted hydrilla infestations.

Who operates structures

Avoyelles Parish Police Jury

FISH KILLS / DISEASE HISTORY

Fish kills occurred during the 1986 and 1997 drawdowns to control submerged vegetation. This was due to low water levels and warm temperatures which created low dissolved oxygen conditions. Also, fish perished in 1999-2000 due to severe drought conditions which lowered water levels and reduced dissolved oxygen within the complex. In 2008, another fish kill occurred due to low dissolved oxygen (DO) levels from Hurricane Gustav. Fish kills occurred in 2011 due to the Mississippi River Flood. Backwater from the Red River increased Spring Bayou to approximately four feet above pool stage. When the water receded, dissolved oxygen fell below 2.0 mg/l, causing fish to perish.

Largemouth bass virus

In 2003, 20 largemouth bass were tested for LMBV – results - no fish tested positive.

CONTAMINANTS / POLLUTION

Water quality

Water quality parameters measured at the surface and near the bottom during each standardized sample include temperature, dissolved oxygen, pH, and conductivity.

The Louisiana Department of Environmental Quality (LDEQ) collects fish samples in waters throughout the state, in order to determine mercury concentrations in fish tissues. At this time there are no fish consumption advisories listed for Spring Bayou.

<http://www.deq.louisiana.gov/portal/PROGRAMS/MercuryInitiative.aspx>

In 1979 – 1980, pesticide work on prey and predator fish revealed low level concentrations of the following chemicals BHC, HCB, Toxophene, Deloldrin, Clordane, DDE, DDD and Mirex.

BIOLOGICAL

Fish sampling history

From the 1960's through the early 1980's, biomass sampling (rotenone) was the preferred fish population sampling tool. From the mid-1980's until present, other techniques including electrofishing, creel surveys, entanglement gear, biomass (rotenone), haul seines, and water quality sampling have provided necessary data related to managing Spring Bayou fish populations.

Note: All standardized sampling data collected by the Inland Fisheries Section from 1965 through present are computerized. Any data prior to 1965 that may exist in the form of paper documents or reports are filed in the LDWF District 6 Office in Opelousas.

Gear

Biomass (rotenone) samples consist of three to four, one acre block-off net samples between the months of May through September. The standard rotenone application rate is three pints of 5% active emulsified rotenone/acre-foot. Biomass sampling is still used as an important management tool but is used much less frequently due to public concern over chemical usage and fish kills. From the rotenone samples of 1954 through 1985, the average total pounds/acre was 445. From 1986 through 1998, rotenone samples averaged approximately 284 total pounds /acre. These numbers are low due to a submerged vegetation problem which consisted mainly of hydrilla. More recently, other sampling techniques such as electrofishing, gill nets, lead nets, haul seines and creel surveys have been utilized to assess fish populations and angler usage.

Table 3. Historical and current sampling gear employed to assess fish populations in Spring Bayou, Louisiana from 1954 – 2016.

Spring Bayou Fisheries Sampling	
Year	Sampling Method
1954	Rotenone
1962	Rotenone
1963	Rotenone
1964	Rotenone
1970	Rotenone
1975	Rotenone
1977	Rotenone, gill nets
1979	Rotenone, gill nets
1981	Rotenone
1982	Rotenone
1983	Rotenone
1985	Rotenone
1986	Rotenone
1987	Rotenone, electrofish
1988	Rotenone, electrofish
1989	Electrofish, rotenone, creel survey
1990	Rotenone, electrofish, seine, gill nets
1991	Electrofish, gill nets, seine
1992	Electrofish, gill nets, creel survey
1993	Electrofish, seine, gill nets, frame nets
1994	Electrofish, seine, gill nets, frame nets
1995	Electrofish, seine, gill nets
1996	Electrofish, seine, gill nets
1997	Electrofish
2000	Electrofish
2001	Electrofish
2002	Electrofish
2003	Electrofish, seine
2005	Electrofish
2007	Electrofish, seine
2008	Electrofish
2009	Creel survey
2010	Electrofish
2011	Electrofish, gill nets
2012	Lead nets, aquatic vegetative type map
2013	Electrofish, gill nets, aquatic vegetative type map
2014	No samples scheduled
2015	Electrofish, gill nets, water quality, aquatic vegetative type map
2016	Aquatic vegetative type map

In the late 1980's, electrofishing techniques began to be used by LDWF for fisheries assessment of Spring Bayou. This technique is conducted using a Smith-Root pulsator which discharges a controlled electrical current into the water from a specially outfitted boat. The electrical current temporarily stuns and surfaces fish, including largemouth bass and crappies. Fish are dipped from the water, measured, and weighed. The fish are returned to the water alive except when necessary that they be sacrificed for specific studies. For example, fish otoliths are necessary for accurate age determination. The utilization of this equipment along with other sampling gear, such as seines and gill nets, allow biologist to understand and evaluate fish populations and still return many of the fish to the water alive.

Lake records

Based on informal records maintained by LDWF fisheries biologists, the largest bass caught in Spring Bayou was in 1995 and weighed 7.1 pounds.

Stocking history

The total number of fish by species and year stocked into Spring Bayou, Louisiana from 1992 – 2014 is presented in Table 4.

Table 4. Fish stocking history of Spring Bayou, LA, from 1992-2014.

YEAR	FLORIDA BASS	CHANNEL CATFISH	BLUE CATFISH	BLUEGILL	TRIPLOID GRASS CARP
1992		45,000			
1993	68,657				
1998			10,011		
1999	25,156	13,096	8,128	9,225	
2000	30,757				
2001	25,000				
2002	24,390	25,586			
2003	25,270				
2008	27,027				11,166
2009	27,588				
2010	89,306				
2011	20,812				10,000
2012	16,953				
2013					20,000
2014	43,132				
2014	*575,400				
Totals	999,448	83,682	18,139	9,225	41,166
*Sac Fry					

All largemouth bass were stocked as fingerlings, ranging from 1- 2 inches in total length. Fingerlings were released by boat throughout the lake into suitable habitat, such as thick vegetation, button bush, or fallen timber.

Species profile

List of fish species collected by LDWF or are known to occur in Spring Bayou, Louisiana.

Lamprey Family, PETROMYZONTIDAE

Southern brook lamprey, *Ichthyomyzon gagei* Hubbs and Trautman

Garfish Family, LEPISOSTEIDAE

Spotted gar, *Lepisosteus oculatus* (Winchell)

Shortnose gar, *Lepisosteus platostomus* Rafinesque

Bowfin Family, AMIIDAE

Bowfin, *Amia calva* Linnaeus

Freshwater Eel Family, ANGUILLIDAE

American eel, *Anguilla rostrata* (Lesueur)

Herring Family, CLUPEIDAE

Gizzard shad, *Dorosoma cepedianum* (Lesueur)

Threadfin shad, *Dorosoma petenense* (Günther)

Minnow Family, CYPRINIDAE

Common Carp, *Cyprinus carpio* Linnaeus

Cypress minnow, *Hybognathus hayi* Jordan

Weed shiner, *Notropis texanus* (Girard)

Pugnose minnow, *Opsopoeodus emiliae* Hay

Bullhead minnow, *Pimephales vigilax* (Baird and Girard)

Triploid Grass carp, *Ctenopharyngodon idella* (Valenciennes)

Silver carp, *Hypophthalmic molitrix* (Valenciennes)

Sucker Family, CATOSTOMIDAE

Smallmouth buffalo, *Ictiobus bubalus* (Rafinesque)

Bigmouth buffalo, *Ictiobus cyprinellus* (Valenciennes)

Freshwater Catfish Family, ICTALURIDAE

Black bullhead, *Ameiurus melas* (Rafinesque)

Yellow bullhead, *Ameiurus natalis* (Lesueur)

Channel catfish, *Ictalurus punctatus* (Rafinesque)

Blue catfish, *Ictalurus furcatus*, (Lesueur)

Black madtom, *Noturus funebris* (Gilbert and Swain)

Tadpole madtom, *Noturus gyrinus* (Mitchill)

Pirate Perch Family, APHREDODERIDAE

Pirate perch, *Aphredoderus sayanus* (Gilliams)

Killifish Family, CYPRINODONTIDAE

- Golden topminnow, *Fundulus chrysotus* (Günther)
- Blackstripe topminnow, *Fundulus notatus* (Rafinesque)
- Blackspotted topminnow, *Fundulus olivaceus* (Storer)

Livebearer Family, POECILIIDAE

- Western mosquitofish, *Gambusia affinis* (Baird and Girard)
- Least killifish, *Heterandria formosa* Agassiz
- Sailfin molly, *Poecilia latipinna* (Lesueur)

Silverside Family, ATHERINIDAE

- Brook silverside, *Labidesthes sicculus* (Cope)
- Inland silverside, *Menidia beryllina* (Cope)

Sunfish Family, CENTRARCHIDAE

- Banded pygmy sunfish, *Elassoma zonatum* Jordan
- Green sunfish, *Lepomis cyanellus* Rafinesque
- Warmouth, *Lepomis gulosus* (Cuvier)
- Orangespotted sunfish, *Lepomis humilis* (Girard)
- Bluegill, *Lepomis macrochirus* (Rafinesque)
- Dollar sunfish, *Lepomis marginatus* (Holbrook)
- Longear sunfish, *Lepomis megalotis* (Rafinesque)
- Redear sunfish, *Lepomis microlophus* (Günther)
- Spotted sunfish, *Lepomis miniatus* (Valenciennes)
- Bantam sunfish, *Lepomis symmetricus* Forbes
- Florida largemouth bass, *Micropterus floridanus* Kassler et al.
- Northern largemouth bass, *Micropterus salmoides* (Lacépède)
- White crappie, *Pomoxis annularis* Rafinesque
- Black crappie, *Pomoxis nigromaculatus* (Lesueur)

Bass Family, PERCICHTHYIDAE

- Yellow bass, *Morone mississippiensis* (Jordan and Eigenmann)

Perch Family, PERCIDAE

- Creole darter, *Etheostoma collettei* Birdsong and Knapp
- Swamp darter, *Etheostoma fusiforme* (Girard)
- Slough darter, *Etheostoma gracile* (Girard)
- Cypress darter, *Etheostoma proeliare* (Hay)
- Logperch, *Percina caprodes* (Rafinesque)

Drum Family, SCIAENIDAE

- Freshwater drum, *Aplodinotus grunniens* Rafinesque

Nomenclature and phylogenetic order follows Nelson, *et al.* 2004. Common and Scientific Names of Fishes from the United States, Canada, and Mexico, 6th Edition. American Fisheries Society Special Publication 29. 386 pp. Exceptions are noted.

Genetics

Largemouth bass tissues are typically collected during fall standardized electrofishing samples. Otoliths and livers are removed for age/growth and genetic analysis. Otoliths are sent to the age and growth laboratory at LDWF Baton Rouge headquarters and livers are sent to the LSU genetics laboratory for electrophoresis (DNA) analysis. Florida bass influence ranged from 0.0 to 17% during the years in which genome analysis was conducted (Table 5).

Table 5. Observed Florida genome influence on native largemouth bass populations on Spring Bayou, LA during the years of 1989, 1990, 1995 and 2000

Year	N	Northern	Florida	Hybrid	Florida Influence
1989	20	97%	0	3	3%
1990	15	100%	0	0	0
1995	45	93%	4%	3%	7%
2000	18	83%	11%	6%	17%
Values expressed as percent of sample by number					

Threatened/endangered/exotic species

No T&E or endangered species documented in Spring Bayou to date.

Angler Creel Survey

Three creel surveys has been conducted on Spring Bayou. The survey method used was a dockside (fixed access point) survey of completed fishing trips. Fishermen targeted and harvested bluegill in good numbers during all three years. Other species targeted were largemouth bass and black crappie (Table 6).

Table 6. Creel survey estimates of fish harvested from Spring Bayou, LA by all fishermen, 1989 - 2009

Species	1989	1992	2009
Bluegill	60.0%	44.5%	54%
Largemouth bass	19.0%	16.8%	1.0%
Black Crappie	15.5%	18.5%	25.0%
Warmouth	0.1%	11.9%	8.0%
Bowfin	1.7%	2.0%	1.0%
White Crappie	0.0%	2.1%	2.0%
Redear Sunfish	0.1%	1.8%	9.0%
Yellow bullhead	0.8%	0.9%	0.05%
Yellow bass	1.1%	0.1%	0.0%
Channel catfish	0.7%	0.5%	0.0%
White bass	0.3%	0.4%	0.0%
Blue catfish	0.4%	0.0%	0.05%
Freshwater drum	0.1%	0.2%	0.0%
Spotted gar	0.2%	0.1%	0.0%

HYDROLOGICAL CHANGES

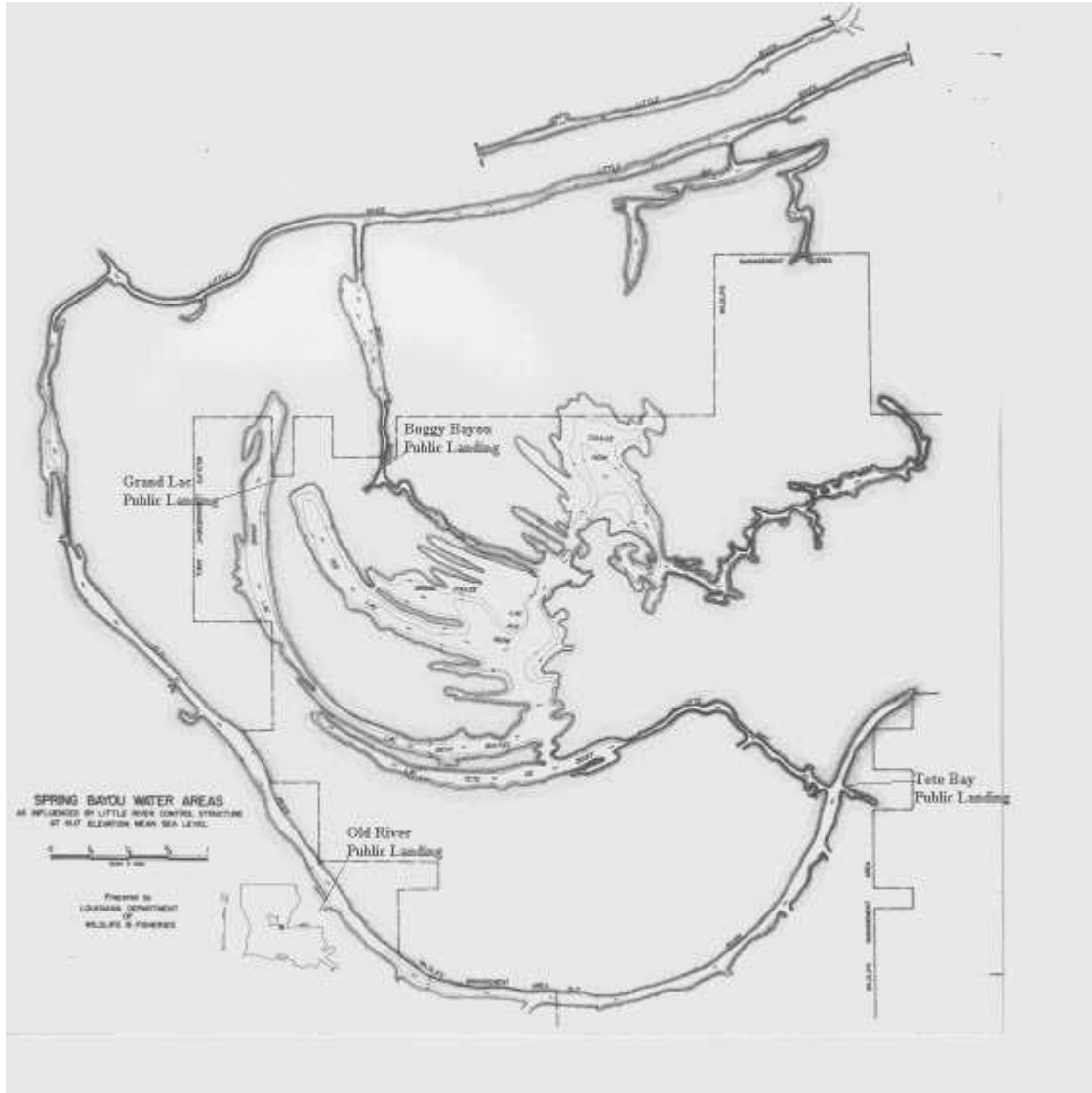
In 1988 – 1989 a channel was dredged 4 miles long and roughly 12 feet deep connecting the major lake systems on the area. Historic hydrologic regimes have been altered by past flood control and land development projects, and fisheries productivity has suffered in some areas as a result. Land clearing is believed to have increased sedimentation in the area's waterbodies. Also, submerged vegetation (hydrilla) problems have reduced boating access and caused low dissolved oxygen conditions and resultant fish die-offs within the Spring Bayou complex.

Water use

Fishing, site seeing, duck hunting, swamp tours and irrigation

APPENDIX I.

Map of Spring Bayou



[\(return to Access\)](#)

Spring Bayou

Estimated dredging cost

- Construct a drawdown channel at Spring Bayou Wildlife Management Area which will start on Boggy Bayou where departmental ownership ends, go to the end of Boggy Bayou where it runs into Little River, then towards the first bridge in Little River. The channel will be dredged to 27' MSL and have a 25 foot bottom with 1 ½ percent slope.
- Dredge material will be deposited adjacent to the channel on the south, west of south-west side. This practice will encourage the growth of trees which will shade the channel and reduce water temperature. Gaps will be left at least every 300 feet and in specific locations so as not to impede water flow of drawdown capabilities.
- The proposed channel (dredging) will facilitate dewatering during drawdown operations and improve boating access as well as fish spawning habitat.

Length of channel to be dredged - 2,377 yards or 1.35 miles

Average cross section – 13.9 square yards

Total volume to be removed – 33,040 cubic yards

Equipment – marsh buggy dragline

At \$3.50 per cubic yard

Add \$20,000 to transport equipment

Total cost = \$135,640

***see attached map**





Boggy Bayou

APPENDIX II – CHRONOLOGY OF ACTIVITIES

APPENDIX II (CHRONOLOGY OF ACTIVITIES)

DATE	ACTIVITY
Summer '94	Hydrilla discovered
Oct 28, 1994	Applied 100# of Aquathol to hydrilla in Boggy Bayou (limited control)
May 13, 1996	Hydrilla surveyed to determine extent and severity of infestation.
June '96	Report based on May survey written.
Jul 22, 1996	Another survey made. Infestation increased substantially.
Aug 1996	Based on two previous surveys, management plan written calling for fall/winter drawdown followed by summer drawdown.
Sep 4, 1996	News release published inviting public to comment on drawdown at a public meeting to be held on Sep 9, 1996.
Sep 9, 1996	Public meeting. Lots of opposition to drawdown.
Sep 10, 1996	Meeting with Avoyelles Parish Police Jury to explain necessity for drawdown and iron out protocols for opening gates. Police Jury claims to need a 3-month notice to open gates.
Sep 11 or 12, '96	Gates opened.
Oct 30, 1996	Gates closed. Cannot maintain drawdown due to rains. Water dropped very slowly while gates were opened and any rain quickly filled the lake up again.
? 1997	Permit applied for and obtained to dredge Boggy Bayou and Little River with Department equipment, but equipment could not be transported to the area.
Jun 16, 1997	Open gates for summer drawdown.
Jul 31, 1997	Ran channel with mudboats to deepen watercourse for better drainage.
1996-1997	1,210 acres of floating and emergent vegetation were treated.* (1 year control)
Oct 31, 1997	Gates closed. Drawdown very successful due to drought conditions.
1997-1998	428 acres of floating and emergent vegetation were treated.* (1 year control)
May 18, 1999	Sonar application: 2.5 gallons A.S. in Tee Lac, 200# S.R.P. in Lac a Deux Boutes. (1 year control)
May 25, 1999	Sonar application: 2.5 gallons A.S. in Tee Lac, 200# S.R.P. in Lac a Deux Boutes. (1 year control)
Jun 3, 1999	Sonar application: 640# (16 buckets) S.R.P. in Coulee Noir. (1 year control)
1998-1999	872 acres of floating and emergent vegetation were treated.* (in addition to approximately 200 acres of hydrilla treated) (1 year control)
Sep 3 1999	Type map
Sep 28, 1999	Mark test plots for Aquathol + Cutrine application.
Sep 29, 1999	Aquathol application. Tete de Boeuf: 5 acres @ 3ppm (1 year control)
Sep 30, 1999	Aquathol application. Tete de Boeuf: 10 acres @ 3ppm (1 year control)
Oct 4, 1999	Aquathol application. Tee Lac: 6 acres @ 1ppm Aquathol + 0.5ppm Cutrine, Lac a Deux Boutes: 6 acres @ 1ppm Aquathol + 0.25ppm Cutrine.
Mar 13, 2000	Estimate areas to be treated with Sonar
Mar 15, 2000	Estimate areas to be treated with Sonar

Apr 12, 2000	Meet with DU, Sepro and USCOE representatives to discuss hydrilla treatment.
May 16, 2000	Mark areas to be treated.
May 18, 2000	Sonar application. Rate = 20ppb. Grand Bay: 38.3 acres, 3' deep = 1.6 gal. A.S. (6 month control)
May 19, 2000	Sonar application. Grand Coulee: 71.4 acres, 3' deep = 2.9 gal. A.S., Tee Lac: 70.5 acres, avg. 5' deep = 4.7 gal. A.S., and Tete de Boeuf: 22.7 acres, 3' deep = 0.9 gal. A.S. (6 month control)
May 22, 2000	Collect water samples for FasTest.
May 24, 2000	Biomass samples. Make Nautique application in Grand Bay and Grand Lac (limited control)
May 25, 2000	Biomass samples.
Jun 6, 2000	Collect water and plant samples.
Jun 23, 2000	Make 2 nd application of Sonar. Grand Bay: 120# S.R.P. and 1 qt. A.S., Grand Coulee: front 15 acres-60# S.R.P., back 15 acres-60# S.R.P. whole area-1 gal. A.S., Tee Lac: 1.5 gal. A.S., Tete de Boeuf: 80# S.R.P. from sta. 1 to 4 and sta. 8 to 11, and 1 qt. A.S. in between. (1 year control)
1999-2000	1,169 acres of floating and emergent vegetation were treated.* (in addition to approximately 230 acres of hydrilla treated) (1 year control)
2000-2001	2,016 acres of floating and emergent vegetation were treated.* (1 year control)
May 14, 2002	Twelve gallons of Sonar A.S. was applied to Tee Lac and thirteen gallons applied to Grand Lake and the distal end of Lac a Deux Boute (limited control)
May 15, 2002	Two gallons of Sonar A.S., furnished by the Avoyelles Parish Wildlife Federation, was applied to Bayou Du Lac (limited control)
2001-2002	1,435 acres of floating and emergent vegetation were treated.* (1 year control)
2002-2003	1,056 acres of floating and emergent vegetation were treated.* (1 year control)
2003-2004	3,003 acres of floating and emergent vegetation were treated.* (1 year control)
March 16, 2005	Aquatic plant management plan written recommending three summer drawdowns with two years of herbicide applications alternating with the summer drawdowns. To facilitate drawdowns Boggy Bayou and Little River will have to be dredged. In the absence of funding for the herbicide treatments, the plan would be to conduct five successive summer drawdowns.
May 31, 2005	A total of 3,800 lbs. (95 buckets - 5 gal.) of SONAR SRP pellets was applied to Tee Lac and Grand Lac for control of 348 acres of hydrilla (1.5 year control)
2004-2005	3,419 acres of floating and emergent vegetation were treated.* (in addition to 348 acres of hydrilla treated) (1 year control)
2005-2006	Thus far in fiscal '05-'06, 1,434 acres of floating and emergent vegetation has been treated. (1 year control)

*Water hyacinth, salvinia, duckweed, American lotus and alligatorweed

APPENDIX III

TYPE MAPS AND NARRATIVES

Spring Bayou Vegetation Survey July 2010
M. Plonsky, P. Allemond

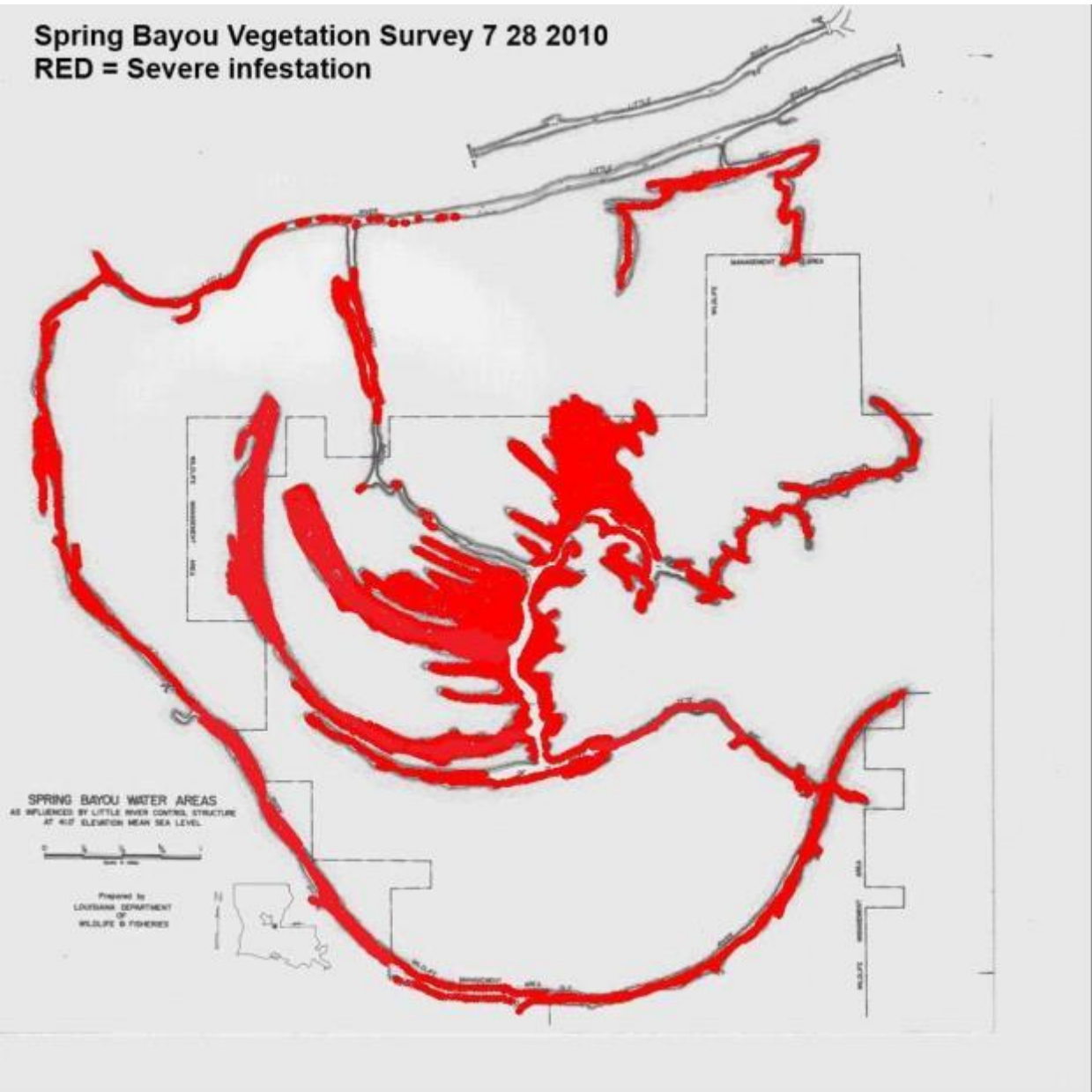
A survey of vegetation in spring bayou was completed on 7-28-2010. The system is inundated with *Hydrilla verticillata*. Hydrilla is found in all areas of this system less than 6 foot in depth. This coverage is found in over 85% of the entire system's water surface. These areas are practically impassable with conventional outboard motors. In these areas is a mix of *Nymphaea odorata*, *Nelumbo lutea*, *Limnolobos spongia*, *Ludwigia peploides*, *Cyanobacteria*, *Carex*, *Lemna minor*, *Polygonum hydropiperoides* and *Eichhornia crassipes*. All of this vegetation combines to form dense mats. Heavy amounts of lotus were observed in Coulee Noir, Boggy Bayou and T-Lac. The thickest mats of sedge were observed in Tete au boeuf. The Old river area of the system is also entirely inundated with *Hydrilla verticillata*. *Spirogyra* is found mixed in with all hydrilla mats. All boatramps were free of vegetation.

A treatment of Coulee Noir, Tee Lac, Lac Au Des Bouttes, Tete De Boeuf And Old River with the herbicide Sonar was applied during the summer of 2009. This herbicide had no effect on the vegetation. A herbicide treatment using Galleon® mixed with Aquathol will be made in late August of 2010. Areas to be treated are coulee noir, tee lac, tete de boeuf and old river. Tete de boeuf was treated with Sonar® on 7 28 2010 as a comparison to the up-coming Galleon/Aquathol treatment.

Just over 11,000 10 to 12 inch grass carp were stocked into Spring Bayou in January of 2008. 50 additional 20 inch grass carp were also stocked with radio transponders inserted in the fish. These fish were tracked for the following 18 months in order to observe for the possible exit of the carp from the system through the spillway structure. In September of 2008, hurricane Gustav moved through the area and a fish kill resulted. Many grass carp were seen dead however their number was low in comparison to the number stocked and radio tagged carp continued to be located in the system for several month following the hurricane until the batteries in the transponders finally expired during the early summer of 2009. Gillnets were set in the winter of 2010 and two grass carp, both over 24 inches total length were captured in Coulee Noir.

Water quality in the system on the date of the 2010 survey was poor with less than 2.0 mg/l of dissolved oxygen found throughout. Lake water level was 40.7 ft and water temperatures were above 85 degrees F. A fish kill was observed earlier in the month and 2 grass carp were seen dead. Neither were fish that had received a transponder and both were over 20 inches in total length.

Spring Bayou Vegetation Survey 7 28 2010
RED = Severe infestation



Spring Bayou Vegetation survey - 8/19/2011

M. Plonsky

Copious amounts of Hydrilla (*Hydrilla verticillata*) continue to infest much of the Spring Bayou complex with heavy amounts persisting in Coulee Noir, Valerie, Tee lac, Grand Coulee and Grand lac and Lac aux Siene. A survey of Lake Francios and Lake Gabriel could not be attempted. These two areas are entirely filled with woody vegetation. An additional 10,000 grass carp (8 to 10 inches TL) were stocked into the system in spring of 2011. This is additional to the 11,400 10 to 12 inch fish stocked in winter of 2008. These additional 10,000 grass carp were stocked in 2011 as a result of local concern of grass carp mortality as a result of hurricane Gustav during the late summer of 2010. Although a fish kill was observed in Spring bayou following Gustav, not many of the fish observed dead by department employees appeared to be grass carp.

Tete des Boeuf and Boggy Bayou are mostly free of hydrilla as well as Old River from the boatlaunch east to the start of the WMA property. Both locations had been treated with the herbicide Sonar (fluridone). Tete des Bouef was treated in the early summer of 2010. Tete des Bouef is however moderately infested with emergent vegetation most notably American lotus (*Nelumbo lutea*). Boggy bayou and Old River both received an application of Sonar in March of 2011.

Coulee noir and Lac a Deux Boute were treated with an application of endothall and penoxsulam in August of 2010. Coulee Noir displayed little improvement with open water visible only for 5 to 6 months following application. Lac a Des Boute treatment result appears more successful of the two locations with the endothall/penoxsulam treated area remaining free of submerged vegetation up until the mid-summer of 2011 and currently displaying only slight to moderate re-infestation. Coulee Noir is entirely infested with submerged, emergent and floating vegetation. Emergent vegetation has returned moderately to Lac a Deux Boute, first appearing in the late spring of 2011.

Lake Grand bayou, Little River and Bay Sec contain only slight amounts of aquatic vegetation with little to no hydrilla observed. This is perplexing given the past amounts of hydrilla witnessed in Lake Grand bayou and Bay Sec. These areas have not received any direct application of fluridone but did receive a slight stocking (200 or so 8 to 10 “) triploid grass carp in 2011 of the 10,000 total that were stocked.

Old River west of the boatlaunch continues to be thick with hydrilla as well as Old River east of the Tee bay boatlaunch. A thick mat of hydrilla was also observed in the Old River side of the chute between Old River and Tete des Bouef. Tee bay boatlaunch was thick with hydrilla

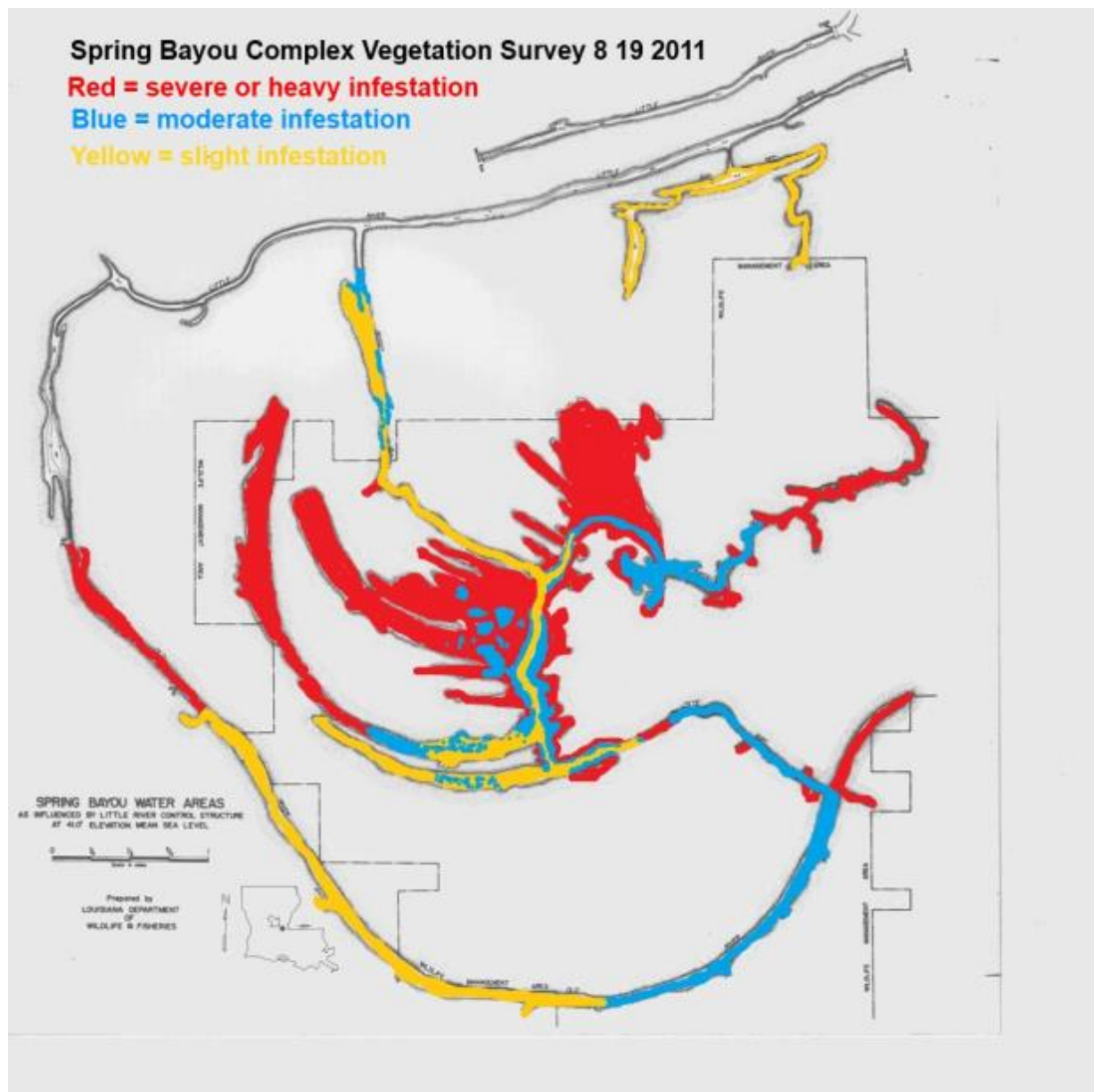
as well as the boatlaunch at Grand lac. Boggy bayou boatlaunch and Bay Sec boatlaunch are mostly free of submerged vegetation and remain very usable for standard outboard motors. Grand lac is entirely covered with hydrilla. This area also had a substantial amount of American lotus (*Nelumbo lutea*). American lotus is also prevalent in Coulee Noir, Tee lac, Grand Coulee, Tete des Bouef, Lac a Deux Boute and along the banks of Boggy bayou near the spoil bank canal. Slight amounts of American lotus were observed in boggy bayou in the private camp area. Duckweed (*Lemna spp.*) and water meal (*Wolffia spp.*) are found throughout the system with slightest amounts observed in Old River in the area free of hydrilla. Water fern (*Azolla caroliniana*) is also found in great supply in the hydrilla infested areas. Small floatons of nut sedge (*Cyperus spp.*) and water primrose (*Ludwigia spp.*) were observed in the Valerie area and mixed within the mats of hydrilla found within the system. Small patches of frogbit (*Limnobium spongia*) and water hyacinth (*Eichhornia crassipes*) were seen throughout the system.

Water quality continues to be problematic throughout the system with dissolved oxygen levels below 1.0 mg/l common at any depth greater than 2 feet. Best oxygen levels were observed in the vicinity of the camps in Old River with dissolved oxygen levels above 2.0 mg/l at 4 feet. Surface, less than 1 foot below surface, dissolved oxygen levels are above 3.0 mg/l throughout except in Valerie where surface DO was less than 2.0 mg/l. This is a large improvement from the surface dissolved oxygen levels as recorded during the backwater flooding event occurring in May of this year which were below 1.0 mg/l at surface throughout the Spring bayou system. Sulfide bubbles could be seen on the surface of the water in Tete des Bouef on 8 19 2011.

Several small openings in the hydrilla mats were observed in the Tee lac area as well as in Grand bay. This may be due to grass carp feeding. Spring bayou suffered fish kills this June. A significant rise in the Atchafalaya River due to heavy rainfall in the Midwest as well as substantial snowmelt resulted in water levels above 44 feet within the Spring bayou system. Pool for this system is currently 41 feet MSL. This water input was black in color and was low in dissolved oxygen. It is believed that this was swamp backwater that was pushed into the system through little river from the hundreds of acres of flooded swamp land located between the Spring Bayou system and the Atchafalaya river 7 miles to the east. Area rainfall amounts were below average preceding the river rise with much of surrounding areas in drought. As this backwater moved into the system and sat for several weeks, water conditions diminished and fish kills were experienced. Few grass carp were observed dead. Tracking of the 12 radio implanted grass carp both before and after the fish kills resulted in similar number of located fish and displayed tagged fish movement within the system following the fish kills.

Date	Temp	SpCond	Salinity	Depth	pH	pHmV	Turbidity+	Chlorophyl	d.o. percent	d.o. mg/l	station
8/19/11	29.95	0.241	0.11	2.540	7.28	-15.7	4.0	30.9	11.80	0.89	valerie
8/19/11	30.58	0.240	0.11	0.458	7.21	-11.7	4.3	36.0	22.20	1.66	
8/19/11	30.53	0.237	0.11	1.807	7.30	-16.8	501.4	50.9	17.00	1.27	grand bay
8/19/11	31.05	0.236	0.11	0.369	7.38	-21.3	4.3	37.1	51.80	3.84	
8/19/11	28.60	0.275	0.13	8.410	6.92	4.7	11.8	190.4	4.70	0.36	c. noir
8/19/11	31.36	0.237	0.11	0.378	7.31	-17.8	3.8	35.3	47.70	3.52	
8/19/11	30.59	0.247	0.12	3.032	6.81	10.8	37.0	18.0	5.80	0.43	t. bouef
8/19/11	31.23	0.244	0.11	0.504	7.29	-16.5	5.2	72.9	63.80	4.72	
8/19/11	29.46	0.317	0.15	3.266	6.72	15.9	58.2	2.3	7.10	0.54	lac boutte
8/19/11	30.33	0.228	0.11	0.416	7.18	-10.1	5.4	47.0	42.80	3.21	
8/19/11	25.83	0.392	0.19	10.406	6.66	19.1	64.7	167.1	7.10	0.58	tee lac
8/19/11	30.96	0.234	0.11	0.436	7.25	-14.4	3.6	69.6	46.20	3.44	
8/19/11	28.30	0.332	0.16	8.619	6.67	18.6	12.7	239.9	6.10	0.47	spoil
8/19/11	31.41	0.235	0.11	0.454	7.25	-14.0	3.3	55.7	47.90	3.53	
8/19/11	30.86	0.231	0.11	1.455	7.44	-25.1	885.4	46.0	26.10	1.94	boggy
8/19/11	32.50	0.235	0.11	0.317	7.66	-37.7	16.5	33.3	91.90	6.65	

Date	Temp	SpCond	Salinity	Depth	pH	pHmV	Turbidity+	Chlorophyl	d.o.percent	d.o. mg/l	station
8/8/11	32.44	0.459	0.22	0.713	7.95	-54.2	12.2	40.1	90.80	6.57	old river camps
8/8/11	32.73	0.457	0.22	0.170	7.97	-55.3	14.0	37.4	97.80	7.05	
8/8/11	30.98	0.267	0.12	3.192	7.40	-22.4	72.7	29.1	9.10	0.68	
8/8/11	34.05	0.256	0.12	0.406	7.97	-55.7	4.6	26.7	115.60	8.15	tee bay
8/8/11	32.12	0.365	0.17	2.357	7.53	-30.2	15.6	30.6	18.50	1.34	
8/8/11	33.64	0.396	0.19	0.320	8.27	-72.5	13.7	29.5	119.30	8.47	tete de bouef
8/8/11	32.60	0.370	0.17	2.063	7.77	-43.7	13.0	32.4	45.30	3.27	



Red areas are impassable with standard outboard motor or paddle.

Blue areas are passable with outboard but may require the cleaning of the prop.

Yellow areas are easily passable with outboard or paddle.

Spring Bayou Aquatic Vegetation Typemap - 9/10/2012

Spring bayou WMA continues to be heavily infested throughout with submerged (*Hydrilla verticillata*, *Ceratophyllum demersum*, *Cabomba caroliniana*, *Utricularia spp.*) emergent (*Alternanthera philoxeroides*, *Cyperus spp.*, *Hydrocotyle spp.*, *Ludwigia spp.*, copious *Nelumbo lutea*, *Zizaniopsis miliacea*) and floating aquatic vegetation (*Eichhornia crassipes*, *Lemna spp.*, *Salvinia minima*, *Limnobium spongia*) predominantly . However, the Old River area from the T' bay boatlaunch back to the Old River boatlaunch is nearly completely free of any aquatic vegetation with only a light fringe of water primrose and water hyacinth observed sporadically occupying the banks. A thin amount of hydrilla growing into a large impassable mat does exist in Old River at about the entrance to the Old River boatlaunch and extends westerly beyond the Old river boatlaunch. The eastward end of Old River just east of the T'bay boatlaunch is once again free of submerged vegetation. This area had cleared of hydrilla about two years ago with a moderate return of hydrilla in this area during the summer of 2011. Numerous grass carp were captured in gill nets set in this area in November of 2011. Suitable water quality with dissolved oxygen level measured above 2.0 mg/l persisted in Old River throughout 2012. There were no reports of fish kills in Old River for the summer of 2012. Below are photographs of Old River, west end and east end at T'bay. Water color in Old River is very brown and muddy on the western end with clearer water on the east end. Lake Water Level = 41 feet (pool).



Old River near Old River boatlaunch looking west.



Old River near Old River boatlaunch looking east.



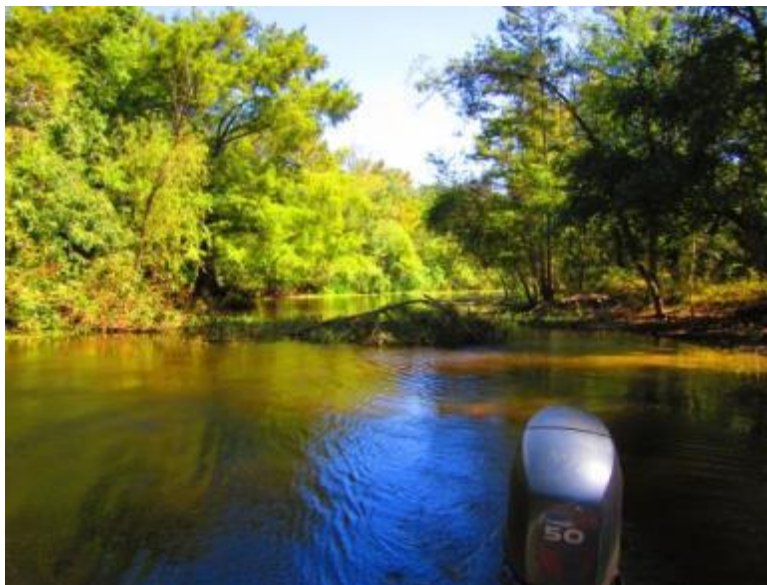
Old River near T'Bay boatlaunch(center right) looking east.

An accumulation of Common Salvinia, Duckweed, Water Hyacinth and light amounts of hydrilla was encountered in the entrance to the chute, the narrow connective canal between Petite bay and Lac Tete de Bouef. This raft of vegetation spanned the bayou and is an often troublesome accumulation location. A picture of the raft is below.



Entrance into “chute” from Petite Bay.

Two fallen trees most likely a result of hurricane Isaac, which moved through the Spring Bayou area in late August, was observed in the chute. There were no reports of dead fish in Spring Bayou following Isaac.



Fallen trees in chute.



Lac Tete de Bouef is free of submerged vegetation from its eastern end entrance to about halfway to its western end. At this point, a heavy amount of hydrilla is apparent along with hydrilla, coontail, American lotus, duckweed, common salvinia, water primrose and water hyacinth.



Lac Tete de Bouef entrance from Spoil bank canal looking east to back of Lac.

Lac a Deux Boute is impassable by outboard or paddle from the spoil bank canal entrance to Grand Lac. Open water persisted in Lac a Deux Boute until early August. Aquatic vegetation

observed is similar to what is found throughout the WMA. A picture of the entrance at the spoil bank location is below along with a picture looking towards Tee Lac.



Spoil bank canal entrance into Lac a Deux Boute



Looking towards Tee Lac from entrance into Lac a Deux Boute

The patches of open water observed in Tee Lac during the vegetation survey of 2011 have diminished considerably. One small open area remains visible. Tee Lac and Lac aux Siene are impassable with outboard or paddle. Below is a picture of Tee Lac as well as pictures of the shallow area east of Tee Lac, Lac aux Siene, located behind the spoil mounds from the spoil bank canal.



Tee Lac



Spoil bank mounds across from Tee Lac (Lac aux Siene)



Spoil bank canal looking south back towards Lac a Deux Boute from Tee Lac entrance

Coulee Noir is impassable with outboard motor or paddle. Heavy amounts of hydrilla continue to plague this location despite the continual presence of radio transmitter inserted grass carp located within coulee noir during the grass carp tracking events from early winter of 2011 through July of 2012. Heavy amounts of coontail are also present. Below is a picture of coulee noir on 9 10 2012.



Coulee Noir looking west with spoil bank canal on left



Coulee Noir



Coulee Noir looking east with spoil bank canal on right

The Grand bay area and the channel to the entrance into the Bayou da la Bay area remains light with aquatic vegetation within the center of the channel, however, Bayou de la Bay itself is impassable due to heavy accumulations of aquatic vegetation especially submerged hydrilla. A picture of this area is below.



Grand Bay area located between Coulee Noir and Bayou da la Bay



Entrance into Bayou de la Bay

Lake Francios and Lake Gabriel are unapproachable by outboard or paddle due to complete coverage of aquatic vegetation.

Boggy Bayou canal from Lac aux Siene to the entrance of Boggy Bayou Lake is relatively free of submerged vegetation but slight to moderate amounts of hydrilla were observed along the banks. The Boggy Bayou boatlaunch is free of vegetation but is bordered on both sides

with a healthy accumulation of hydrilla especially in the area between the Boggy Bayou boatlaunch landing and the bank.

The area just outside the WMA to the north of the boatlaunch, Boggy Bayou Lake, is almost impassable due to submerged aquatic vegetation except for a narrow strip traversing the lake from north to south. This lake is very shallow with average depth of 2.5 feet. A picture of Boggy Bayou Lake is below.



Boggy Bayou Lake looking north from southern end

From Boggy Bayou lake heading to the spillway down little river, only slight amounts of submerged aquatic vegetation was observed. A proliferation of American lotus occurred in little river this spring located just before the Bay Sec boatlaunch. Slight amounts of Alligator weed are found in front of the lake drain pipes. The Bay Sec boatlaunch is free of accumulations of aquatic vegetation.

Grand Lac is almost entirely entombed with submerged, emergent and floating aquatic vegetation except for the very noticeable open area around the boatlaunch extending across the lake and to the right of the boatlaunch. This area was cleared during the aquatic weed harvester demonstration back in August of 2012. This demonstration was conducted by local private owners of the aquatic vegetation harvester in hopes of gaining acceptance of this apparatus as a successful addition to the war on aquatic weed infestation in Spring Bayou. Pictures of the harvester and its handy work around the Grand Lac boatlaunch are below. The open water created is also represented on the Spring Bayou 2012 vegetation survey map attached to the end of this report.



Aquatic Vegetation Harvester



Grand Lac boatlaunch 9 10 2012



Grand Lac boatlaunch looking north in Grand Lac after harvester demonstration

Water qualities were obtained using an YSI 6600 sonde. This data is below. Dissolved oxygen levels were highest in Old River and were lowest in the WMA. Dissolved oxygen levels below 3.0 mg/l were common in the WMA. Water color was a muddy brown in Old River and water in the WMA area was a clear black. This fact is evident in the turbidity readings of the YSI sonde.

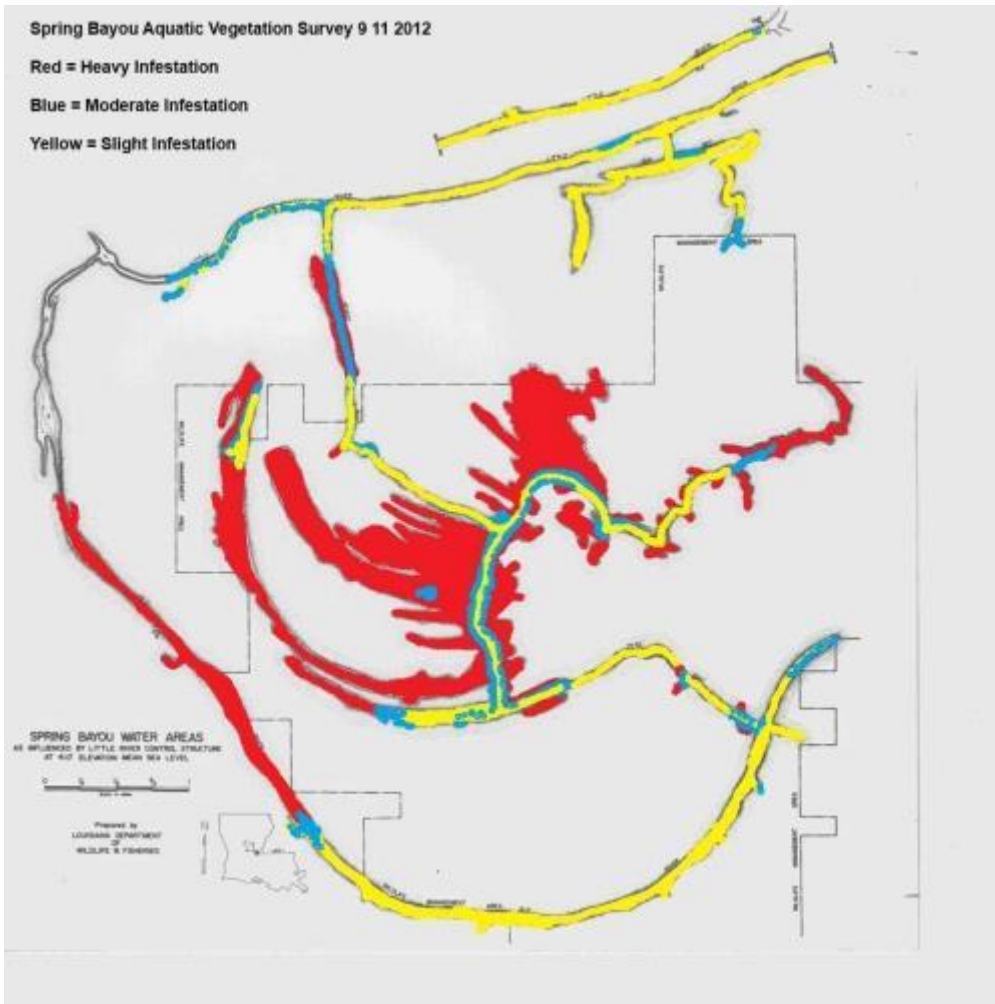
Date	Temp	SpCond	Salinity	Depth	pH	Turbidity+	Chlorophyl	d.o. mg/l	location		
9/10/12	26.76	0.273	0.13	2.156	8.43	11.6	14.4	6.19	old river near boatlaunch		
9/10/12	27.34	0.273	0.13	0.885	8.08	8.6	14.0	5.81			
9/10/12	26.82	0.242	0.11	1.904	7.96	4.1	23.5	4.80	tee bay boatlaunch		
9/10/12	27.68	0.240	0.11	0.537	8.00	3.0	19.6	5.16			
9/10/12	26.52	0.248	0.12	2.285	7.85	1.1	31.9	2.86	tete au bouf		
9/10/12	26.79	0.247	0.12	0.641	7.84	8.5	41.2	2.79			
9/10/12	25.82	0.247	0.12	10.739	7.52	6.8	23.2	1.82	tee lac canal		
9/10/12	27.25	0.237	0.11	0.638	7.47	1.6	30.4	2.23			
9/10/12	25.82	0.251	0.12	4.272	7.27	1.8	22.3	2.17	grand bay		
9/10/12	27.28	0.245	0.11	0.753	7.23	1.9	30.1	2.74			
9/10/12	25.59	0.241	0.11	3.663	7.30	1.1	21.0	2.55	boggy bayou boatlaunch		
9/10/12	26.78	0.239	0.11	0.643	7.29	1.3	28.4	3.53			

Spring Bayou Aquatic Vegetation Survey 9 11 2012

Red = Heavy Infestation

Blue = Moderate infestation

Yellow = Slight Infestation



Spring Bayou Aquatic Vegetation Survey 8 15 2013

J. David, M. Plonsky survey personnel

Report submitted by M. Plonsky

The majority of Spring Bayou continues to be covered with *Hydrilla verticillata* except for Old River, Tete de Bouef and in the vicinity of the Grand Lac boat launch as well as all of the deeper bayou portions of Boggy Bayou, center portions of Grand Bay through to Bayou de la Bay and the Spoil Bank Canal. An aerial application from a helicopter of the herbicide glyphosate, trade name Aquamaster, was completed on 08/08/2013 for control of American Lotus (*Nelumbo lutea*). Areas treated were Coulee Noir, Tee Lac, Grand Coulee and Lake Francios (see attached map). The survey of these areas one week after demonstrated a noticeable browning of lotus. An application of endothall into Coulee Noir, Tee Lac and Lac a Deux Boute was initiated later in this month, 08/21/2013, in an attempt to create usable boatlanes. As of 8/27/2013, no injection of endothall into Coulee Noir was completed due to low water levels. No lotus was observed in Old River and only small patches of lotus were visible within Tete de Bouef, especially near the lake's eastern terminal end. Light patches of lotus were observed within Grand Lac with light amounts of hydrilla. The vicinity near the Grand Lac boatlaunch was free of aquatic vegetation. Lac a Deux Boute was entirely full of heavy amounts of hydrilla with a heavy covering of water meal, duckweed and patches of common salvinia. A light amount of lotus is present at this area's southern end near the spoil bank canal.

Old river from the Tee Bay boatlaunch to the Old River boatlaunch was free of hydrilla and little to no aquatic vegetation was observed except for a light fringe of water meal (*Lemna valdiviana*), duckweed (*Spirodela polyrhiza*) and common salvinia (*Salvinia minima*) seen along the shallow banks within the WMA portion of Old River. The vicinity of the private camps along Old River was free of all aquatic vegetation. Hydrilla can still be found in moderate amounts just north of the Tee Bay boatlaunch in Old River but only light amounts were observed just east of the Old River boatlaunch. The shallow water of this area disallowed any further observation east of the Old River boatlaunch. Lake water level on the day of the survey was 40.6 ft. MSL. System pool is 41 ft. MSL. Elevated water levels greater than 45 ft. MSL occurred within the complex during the early months of 2013 with concerns regarding flooding of camps along Little River. Discussions regarding the opening of the spillway drains for flood abatement were dismissed due to the equal water level occurring on both sides of the spillway. Road conditions to the spillway during this event were impassable by most means of transport due to water and mud covered dirt road and arrival by boat was not possible due to a low bridge which crosses Little River.

Heavy amounts of nut sedge (*Cyperus odoratus*) and water primrose (*Ludwigia spp.*) exist within the shallow bankside areas of the WMA, however none of this vegetation was seen floating within the deeper bayou portions of the system and was not posing any problems for boat traffic. This may change as hydrilla coverage within the WMA decreases due to grass carp

feeding freeing the floating vegetation to drift out into the main channels. A stocking of an additional 20,000 grass carp to the existing 21,000 stocked since 2008, will occur this coming fall of 2013.

Light amounts of hydrilla and coontail (*Ceratophyllum demersum*) were observed near the Old River boatlaunch. Moderate amounts of hydrilla were seen at the Boggy bayou boatlaunch. Grand Lac boatlaunch is free of hydrilla. All boatlaunches are usable and not impeded by vegetation.

Water meal and duckweed were seen throughout the entire complex but did not pose any problem for boat passage. Moderate amounts of common salvinia were observed mixed within the water meal and duckweed. NO GIANT SALVINIA WAS OBSERVED. Most bank areas of the bayou portions of the system is crusted with thick clumps of giant cutgrass (*Zizaniopsis miliacea*) but do not pose any problem with regard to boating or fishing access at this time. Small patches of frog's bit (*Limnobium spongia*) were observed mixed in the accumulations of other aquatic vegetation noted. No survey of Little River, Bay Sec or the spillway structure was conducted at this time due to low water levels. Below are water qualities for Spring Bayou as well as before and after pictures of one of the glyphosate treated areas, Coulee Noir, fishing activity on the day of the survey in Tete de Bouef and Old River.

Date	Temp	SpCond	Salinity	Depth	pH	pHmV	Turbidity+	Chlorophyl	percent d.o.	d.o. mg/l	location
06/28/13	27.67	0.094	0.04	3.496	6.56	26.0	8.0	19.1	12.50	0.99	grand bay
06/28/13	30.19	0.086	0.04	0.182	6.69	18.3	7.2	16.7	40.30	3.04	grand bay
06/28/13	29.94	0.153	0.07	3.729	6.67	20.0	4.8	2.1	11.70	0.89	coulee noir
06/28/13	31.12	0.085	0.04	0.100	6.82	11.0	10.7	25.6	53.20	3.94	coulee noir
06/28/13	30.60	0.141	0.06	3.293	6.98	1.0	6.0	1.0	7.40	0.56	tete de bouef
06/28/13	31.64	0.073	0.03	-0.055	7.70	-42.0	9.4	18.8	101.20	7.44	tete de bouef
06/28/13	31.33	0.104	0.05	3.680	6.88	7.5	3.6	0.0	9.50	0.70	old river
06/28/13	32.71	0.097	0.04	0.235	7.08	-5.1	309.3	22.4	77.70	5.61	old river
06/28/13	27.68	0.113	0.05	5.582	6.58	25.1	3.5	0.7	6.40	0.51	boggy bayou
06/28/13	29.42	0.082	0.04	0.227	6.53	28.0	12.8	30.0	19.30	1.47	boggy bayou

Date	Temp	SpCond	Salinity	Depth	pH	pHmV	Turbidity+	Chlorophyl	percent d.o.	d.o. mg/l	location
08/15/13	28.42	0.106	0.05	2.321	7.29	-17.4	137.7	34.2	57.60	4.47	old river
08/15/13	28.88	0.105	0.05	0.144	7.31	-18.6	15.2	38.5	75.00	5.78	old river
08/15/13	28.64	0.107	0.05	2.762	7.05	-3.2	9.9	0.9	8.00	0.62	tete de bouef
08/15/13	28.73	0.097	0.04	0.055	6.97	1.5	11.9	46.0	30.00	2.32	tete de bouef
08/15/13	27.75	0.102	0.05	4.315	6.77	13.9	7.3	25.0	6.60	0.52	coulee noir
08/15/13	28.18	0.095	0.04	0.452	6.78	12.9	8.5	30.5	12.70	0.99	coulee noir
08/15/13	28.47	0.096	0.04	5.486	6.89	6.7	21.2	20.4	17.30	1.34	boggy bayou
08/15/13	29.29	0.094	0.04	0.173	6.96	2.2	9.6	25.6	43.90	3.36	boggy bayou



Coulee Noir 06/28/2013



Coulee Noir 08/08/2013



Coulee Noir 08/15/2013



Tete de Bouef 08/15/2013



Old River 08/15/2013

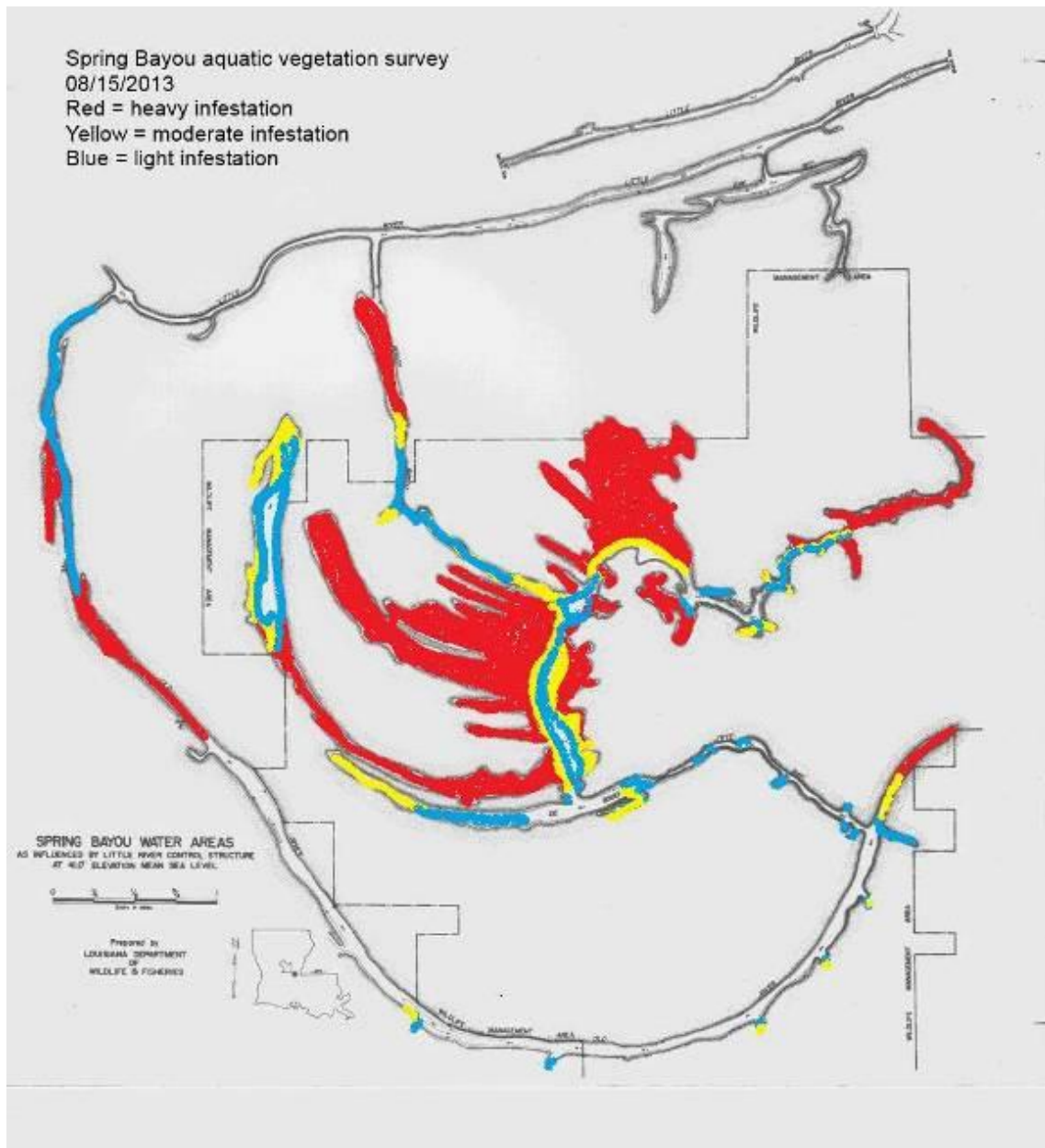
Spring Bayou aquatic vegetation survey

08/15/2013

Red = heavy infestation

Yellow = moderate infestation

Blue = light infestation



The Louisiana Department of Wildlife and Fisheries has scheduled an aerial herbicide application to control vegetation in Spring Bayou. American lotus, a large floating pad, has expanded in coverage to the extent that navigation has become severely impeded. Approximately 300 acres of the vegetation will be treated in areas outlined below. The Department urges anglers and boaters to stay away from the treatment areas on August 8, 2013.

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LDWF Schedules Aerial Herbicide Application in Spring Bayou

The Louisiana Department of Wildlife and Fisheries has scheduled an aerial herbicide application to control vegetation in Spring Bayou. American lotus, a large floating pad, has expanded in coverage to the extent that navigation has become severely impeded. Approximately 300 acres of the vegetation will be treated in areas outlined below. The Department urges anglers and boaters to stay away from the treatment areas on August 20, 2013.

All herbicides used in LDWF control efforts are approved by the Environmental Protection Agency as safe for aquatic use. No fish consumption advisories will be issued for the Spring Bayou herbicide application areas.

In August of 2013, a total of 19 acres of hydrilla was treated in Coulee Noir, Tee Lac and Lac a de Boutte to clear access lanes using an in-water treatment of the contact herbicide Aquathol K at a rate of 4 ppm. Upon investigation a month later these lanes were opening up and allowing boating access. Also, 6 acres of hydrilla were treated at all four boat landings using the systemic herbicides SONAR PR & Q at a rate of 6 ppm. As of October of 2013, hydrilla infestations were considerably reduced in these areas.



Aerial photo of the Spring Bayou Complex highlighting areas where contact herbicides were applied in 2013 to open access lanes.



Spring Bayou Aquatic Vegetation Survey August 2014

Personnel; J. David, M. Plonsky

A survey of aquatic vegetation revealed a considerable reduction in *Hydrilla verticillata* within Coulee Noir, Tee Lac, Lac aux Seine, and Lac a Deux Boute. Water level in the lake on the day of the survey was 41.45 ft. Pool for this system is 41 ft (spillway height). Numerous days of elevated water levels existed within Spring Bayou this year. Local rainfall totals were improved from the previous two years. This year has so far been a good year for improved water qualities in the Spring Bayou complex with no reports of dead fish within the system this year to date. Water quality was recorded on the 6600 YSI sonde from the spoil canal at the entrance to tee lac. Bottom water at a depth of 7 feet provided 2.0 mg/l of dissolved oxygen. Ph at both top and bottom were at 7.4 at 12:30pm. Water was very clear with a NTU reading of less than 10.

Old River remains completely free of hydrilla. Little to no problem vegetation was seen in Old River or the Tee Bay boat launch area. Additional area bordering Old River has now become free of hydrilla. Gill net samples collected in November of 2013 contained grass carp at all location sets throughout the complex and Old River. Grass carp appeared healthy and free of lesions or parasites.

Hydrilla can be found within the shallow backwater areas of the complex in which exists poor water quality in comparison to the deeper more open areas of the complex. For the past couple years, we would see an opening in the hydrilla occur within Tee Lac only to see this area once again close back up by the end of the summer. These were summers characterized by high air and water temps, low rainfall amounts and deflated dissolved oxygen levels. We will see if the open water in Tee Lac persists.

Other vegetation observed was American lotus which was covering the surface of Tete De Bouef and Lac A Deux Boute. Reports of thick lotus within grand lac have been stated in recent meetings but this area was not surveyed this day. An attempt to do so was made by boat from Lac A Deux Boute but could not be completed due to excessive amounts of water meal and hydrilla found in the gap connecting Lac A Deux Boute to grand lac. Pictures of Grand Lac from the boat launch were taken 07/02/2014 and are included in this report along with pictures taken on 07/30/2014. All lotus observed within tete des bouef and Lac A Deux Boute was easily navigated through and posed no problems of access. Water meal was found through the complex with excessive amounts seen in the Valerie/ De La Bay areas. This area was the most inundated with excessive aquatic vegetation. Water levels in this area are shallow and copious amounts of swamp gas was emitted to the water's surface upon bottom disturbance by the outboard motor.

Coulee Noir was free of lotus and has remained so throughout 2014, as of the date of this report. A slight return of lotus was seen in the vicinity of tee lac mostly in the direction of Grand Coulee. Little to no lotus was observed within lac aux seine. No large flotons of vegetation were

encountered and travel within the complex is better than last year. Higher water levels help with navigation as well. Areal application on American lotus is scheduled for August 20th 2014.

A fringe of hydrilla was observed lining the banks of boggy bayou from the spoil bank canal cut back to the WMA HQ. Boggy Bayou boat launch was free of vegetation and the new boat docks were complete.

NO GIANT SALVINIA OBSERVED. Very little common salvinia observed. A slightly greater amount of Azolla was seen throughout the complex than in previous years mostly in the shallower (less than 2 foot) areas. Very little water hyacinth was seen.

Vegetation percent:

Hydrilla = approximately 15% of vegetative cover

All other vegetative types = 35% of biomass which includes water hyacinth, alligator weed, pennywort, common salvinia, lotus, duckweed, water meal, frog's bit and primrose.



Grand Lac boat launch 7 2 2014



Coulee Noir 7 30 2014



Tete De Bouef 7 30 2014 (little hydrilla beneath the lotus)



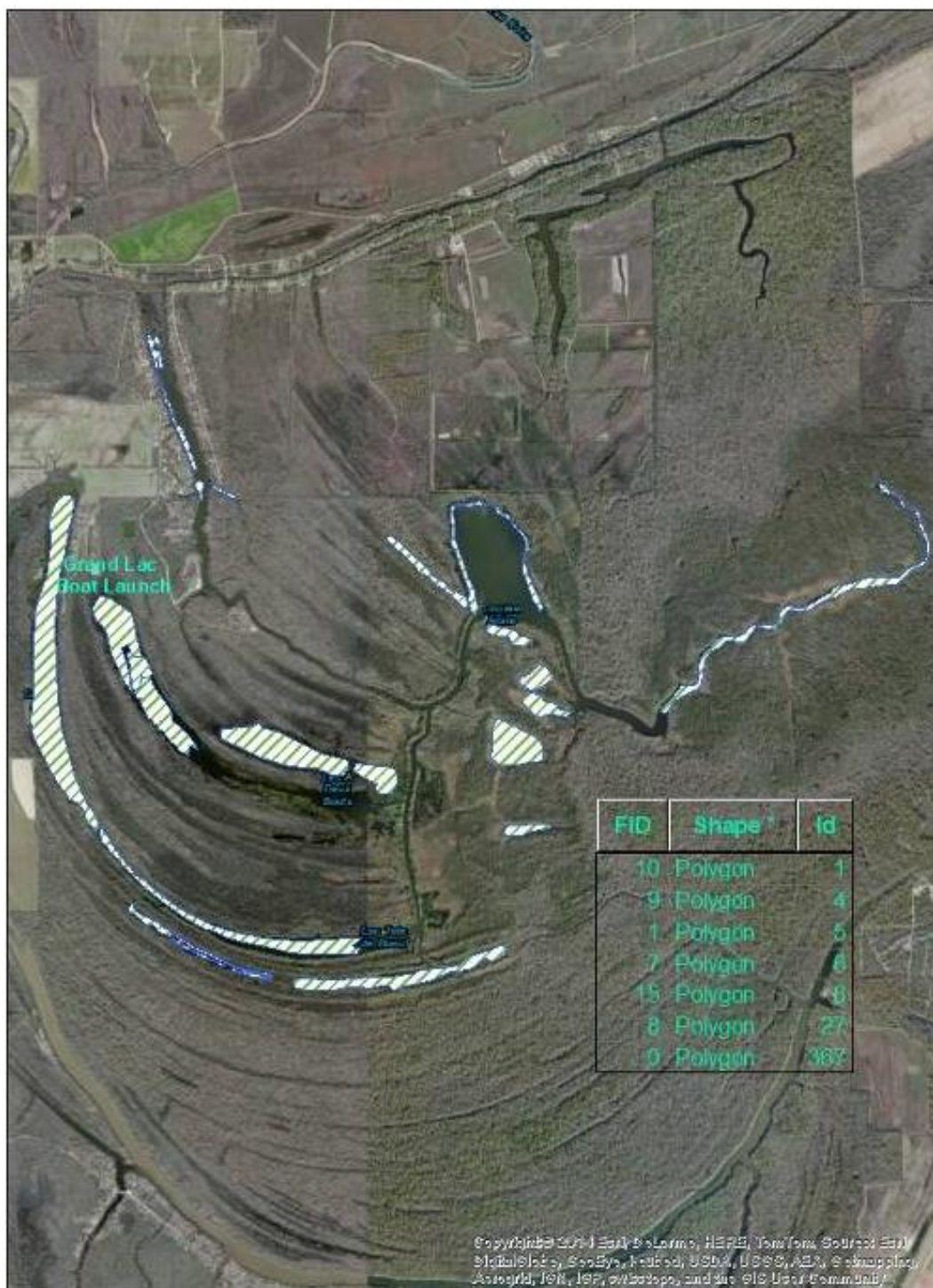
New dock Boggy Bayou boat launch 7 30 2014



Petite Bay boat launch 7 30 2014 (cove just past boat launch is newly open water free of hydrilla)



Grand Coulee/ Tee Lac 7 30 2014



Surface area = 2,718 ac at pool stage, Hydrilla infestation totaling 15.38% SAV 418 acres.

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APPENDIX IV

Spring Bayou - Triploid Grass Carp Tracking Report 2011-2012

Twelve 10" to 12 "grass carp with implanted transmitters were stocked into Spring Bayou WMA on December 09, 2010. Six fish were placed in Grand Lac and six were placed into Tee Lac. Fish were located within the system periodically using a portable transmitter receiver in order to determine if the grass carp would exit the Spring Bayou complex via the Little River spillway structure. A stationary transmitter receiver was placed at the spillway and contained recorded data uploaded monthly. Fish transmitters continued to operate until July of 2012 when transmitter battery life ceased. During the monitoring event, twice the water level in spring bayou exceeded the spillway height of 41ft. MSL. A high water level in the Red and Atchafalaya Rivers resulted in backflow into Spring Bayou over the spillway followed by an outflow. This occurred between May of 2011 until mid-July of 2011 with water levels exceeding spillway height by 2 feet for multiple weeks.

Fish kills were observed in Spring Bayou that summer following the receding of the river flood followed by little rainfall. Very few grass carp were observed dead within these fish kills. Number of located transmitter fish remained similar both before and after 2011 summer fish kills with 8 to 10 of the 12 fish being located. An increase in the number of grass carp located in Coulee Noir occurred following the summer of 2011 demonstrating fish movement.

A second high water event occurred during the late winter/ spring of 2012 with water levels again 2 feet above the spillway height in April. This was not an intrusion from the river but rather due to heavy rainfall, especially in March. During this event, four of the twelve transmitter grass carp were located at the spillway by the stationary receiver. Three of these fish, fish 05, 06, and 08 were located within spring bayou following the end of this high water event just as they were before and during the high water. Fish 05 was discovered at both the spillway and in Grand Lac on the same day (2/6/12). This fact injects doubt in the validity of the stationary transmitter receptions although it is possible that these fish did swim to the spillway and then back to their original locations. Fish 11 was the only fish located at the spillway that was never located anywhere else. It is possible that fish 11 escaped during the second high water event during spring of 2012. An attempt to locate these fish was made at the spillway using the portable transmitter receiver. No fish were located at any time at the spillway using the portable receiver. This high water event only had water moving out of spring bayou whereas the first event had both inflow and outflow. There was no reduction in the number of fish located within Spring Bayou using the portable receiver following this high water event.

Sixteen 300" gillnets of four different mesh sizes were deployed in late November 2011. These nets were laden with grass carp comprising 20% of total catch of 350 fish from in Old River and just off the spoil bank channel near Tee Lac/ Lac des Bouttes. No grass carp with implanted transmitters were captured.

Even with the multiple high water events offering ample opportunity for fish to exit Spring Bayou during this monitoring event, the stocked grass carp have remained and are thriving within Spring Bayou.

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